

Appendix 6-1

Hydraulic Analysis of Future Sewage System

Appendix 6-1. Hydraulic Analysis of Future Sewerage Systems

Estimated Population in Project Site

		Northern Site	Southern Site
Residential	No. of units	0	106
	person/unit	0	2.7
	Population	0	287
Recreation.	GFA (m ²)	100	539
	m ² /staff	20	20
	Staff No.	5	27
Visitors	Person	100	0
F&B	GFA (m ²)	400	231
	m ² /staff	20	20
	Staff No.	20	12

Estimated Sewage Flow from Project Site

	Population	Unit Flow Factor (m ³ /d)	DWF (m ³ /day)	DWF (l/s)
Recreation.	5	0.28	1	0.016
Visitors	100	0.025	3	0.029
F&B	20	1.58	32	0.366
North. Site	125	-	36	0.411
Residential	287	0.37	106	1.229
Recreat.	27	0.28	8	0.088
F&B	12	1.58	19	0.219
Swim. pool ⁽¹⁾	-	-	10.8	6
South. Site	326	-	144	7.536
Total	451	-	180	7.947

Notes:

1. Backwash of swimming pool = 6 litre/s, or 10.8m³/day for 30 minutese operation per day (no peaking factor is required)

Calculation of Pipe Capacity

Diameter (mm)	Area	Ks (mm)	Gradient (1 in)	Velocity (m/s)	Capacity (m ³ /s)
525	0.22	1.5	300	1.15	0.248
825	0.53	1.5	300	1.53	0.818
900	0.64	1.5	900	0.93	0.592

Projected Sewage Flow at Year 2030 and Design Capacity of Different Sewerage Component

	Design Capacity [A] ⁽¹⁾		Projected Flow (ADWF) at 2030		Projected Flow + Flow from Development (ADWF) [B] ⁽¹⁾		Contributing Population ⁽²⁾	Peaking Factor	Projected Flow + Flow from Development (Peak Flow) [B] ⁽¹⁾		[A] > [B]? ⁽¹⁾
	(m ³ /day)	(l/s)	(m ³ /day)	(l/s)	(m ³ /day)	(l/s)			(m ³ /day)	(l/s)	
525mm pipe	21,449	248	4,235	49	4,415	57	16,352	4	17,628	210	Yes
825mm pipe	70,675	818	10,454	121	10,634	129	39,385	4	42,504	498	Yes
NTM SPS	48,902	566	13,246	153	13,426	161	49,726	3	40,256	472	Yes
900mm pipe	51,173	592	14,682	170	14,862	178	55,044	3.006	44,646	523	Yes
NSW SPS	127,526	1476	33,866	392	34,046	400	126,096	2.848	96,938	1128	Yes
YLSTW (existing) ⁽³⁾	70,000	810	44,790	518	44,970	526	-	-	-	-	Yes
YLSTW (future) ⁽³⁾	46,000	532	44,790	518	44,970	526	-	-	-	-	Yes

Notes:

1. For pipe and SPS, the design capacity and flow comparison refer to peak flow; For YLSTW, the design capacity and flow comparison refer to ADWF.
2. Contributing population = Projected Flow + Flow from Development (ADWF in m³/day) / 0.27 (m³/person/day)
3. It is understood that the design capacity of YLSTW may be reduced to 46,000 m³/day after future upgrading.
4. ADWF from development = 180m³/day or 7.95 l/s.